

The invention relates to an arrangement for connecting a drawer frame formed by a metal hollow chamber profile to the facing lateral edge of the associated plate-shaped drawer bottom, in which at least in part-regions of its lower end region opposite the end face of the edge of the drawer bottom the drawer frame has in each case a strip-shaped vertical contact web for the lateral end face of the drawer bottom, and a supporting leg which engages under the drawer base in the proper connection position is bent away from the lower end of the contact web and has integrally projecting from it fixing claws which are pointed or sharpened at their free ends, project over the support surface of the supporting leg and can be pressed into the material of a drawer bottom which is to be fixed, each supporting leg having at least one elongate punched-out slot which is closed all round in its region between the strip-shaped contact web and its free edge, and the fixing claws are attached integrally to one of the edges of the punched-out slot and are extensions formed out of the material of the supporting leg itself which are bent round substantially at right angles in the direction of the drawer bottom.

In recent times, at least in the case of pieces of high-quality furniture, metal hollow chamber profiles which are cut to length for example from metal extruded profiles have been used for drawer frames or side walls. Instead of the extruded profiles which necessitate high investment costs and are therefore expensive to produce, hollow profiles produced from at least two part-profiles bent out of sheet metal have also been used recently as hollow sections for side wall frames (DE 39 34 419 C2). Hollow chamber profiles have, on their underside below the closed profile cavity, a receiving space to receive the running rail of pull-out guides. In order to receive the drawer bottom, the hollow chamber profile is provided in the region inside the drawer with a downwardly-extended contact web for the side surface of the drawer bottom and a supporting leg which adjoins this and is bent round under the drawer bottom and on which the lateral edge region of the drawer bottom rests in the fully assembled drawer. In the junction region of the inner vertical hollow profile wall with the upper face of the drawer bottom a fillet is usually formed which engages over the edge region of the upper face of the drawer bottom and prevents the drawer bottom from being lifted off from the supporting leg. In order also to prevent displacements of the drawer bottom relative to the side wall frame in the horizontal direction, e.g. in the event of jerky abutment of the drawer in the closed position, in addition to screwing the supporting leg to the drawer bottom it is also known for tabs to be cut free from the supporting leg through slots punched in, from the edge,

*The claim in this specification
does not correspond with claims in
the published application.*

these tabs being bent round in their free end region in the direction of the drawer bottom and pointed so that they form fixing claws which can be pressed into the underside of the drawer bottom and thus secure the latter against horizontal displacement (DE 93 03 093 U1). Due to the slotting of the supporting leg which passes through to the free edge in order to form the fixing claws, the supporting leg is weakened in its loading and in its resistance to deformation. Thus it is possible that the portions of the fixing leg remaining between the fixing claws are deformed as the claws dig into the drawer bottom, so that as a result the support surface of the supporting leg on the underside of the drawer bottom is reduced and also the danger of damage to articles stored in a drawer disposed below it due to regions of the supporting leg projecting from the underside of the drawer bottom cannot be excluded.

A connecting arrangement for the side wall frames and bottom of a drawer of the aforementioned type are known from US-A-6 053 592, whilst US-A-5 462 349 discloses such an arrangement in which the contact web for the drawer bottom has two parallel portions which are offset in height. In each case a connector component which extends over the entire length of the associated side wall frame is provided. Thus for drawers of different horizontal depth connector components of correspondingly different lengths must also be used.

The object of the invention is to make possible easier assembly and a secure connection with a high loading capacity of the lateral edge of a drawer bottom on the associated drawer frame irrespective of the length dimensions thereof.

Starting from a connecting arrangement of the type referred to in the introduction, this object is achieved according to the invention in that two or more connector components made from sheet metal are provided which can be installed in the underside of the drawer frame and on each of which is provided the supporting leg which engages under the drawer bottom and is provided with the fixing claws, and that the contact web of the connector component is of such a dimension in terms of height that in the proper fixing position of the drawer bottom on the drawer frame it projects over the underside of the drawer bottom, and that the supporting leg which projects from the lower end of the contact web under the drawer bottom has two parallel strip-shaped leg portions which are offset in height and of which the outer leg portion facing away from the contact web is offset in height relative to the inner leg portion directly

adjoining the contact web by the amount by which the contact web projects over the underside of the drawer bottom in the direction back towards the drawer bottom. By the use of thicker sheet material for the connector components than for the hollow chamber profile which forms the drawer frame, it is possible to ensure the required high loading capacity of the connection between the drawer bottom and the drawer frame.

In this case the contact web of the connector component is preferably of such a dimension in terms of height that in the proper fixing position of the drawer bottom on the drawer frame it projects over the underside of the drawer bottom, and that the supporting leg which projects from the lower end of the contact web under the drawer bottom has two parallel strip-shaped leg portions which are offset in height and of which the outer leg portion facing away from the contact web is offset in height relative to the inner leg portion directly adjoining the contact web by the amount by which the contact web projects over the underside of the drawer bottom in the direction back towards the drawer bottom. By the division of the supporting leg into two leg portions which are offset in height the supporting leg is additionally reinforced.

In this case it is advantageous to provide the punched-out slot in the supporting leg in the junction region between the leg regions which are offset in height, so that then the fixing claw(s) is or are attached integrally to an edge of the punched-out slot which extends parallel to the lateral edge of the drawer bottom.

It is then advantageous if at least a pair of parallel fixing claws is provided spaced from one another on each punched-out slot.

The fixing claws are then advantageously formed by tab-like extensions formed out of the material of the supporting leg in the punched-out region, and the free ends of these extensions are chamfered in such a way that they each form a pointed or sharpened edge which penetrates into the underside of the drawer bottom. In this case the chamfers of the free ends of the fixing claws advantageously extend in the opposite direction to the chamber of the respective other fixing claws, so that the free ends of the fixing claws when they penetrate into the drawer bottom are bent in the opposite direction of deformation.

At least one through hole for the shank of a fixing screw to be screwed into the drawer bottom can be provided in each case in the outer leg portion of the supporting leg of the connector components. In special cases the drawer bottom can be additionally secured against separation from the drawer frame by screwing in a fixing screw through the through hole into the drawer bottom.

The connector component is preferably a punched pressed part made from sheet metal which has in its region to be disposed in the open underside of the drawer frame a cross-section corresponding to the internal cross-section of the region of the hollow chamber profile of the drawer frame which receives the connector component.

The connector component is advantageously provided in its region to be installed in the interior of the drawer frame with fixing means for installation in the hollow chamber profile of the drawer frame, and these fixing means may be formed for example by tabs which are punched out of the material of the connector component and can be fitted or pushed onto associated carrier portions in opposing regions of the drawer frame. Disassembly of the connector components is then also possible. As an alternative, however, the connector components can also be undetachably connected to one another in another manner which is known *per se*, e.g. by riveting by means of blind rivets, interconnection of tongues pushed through slots in one of the components, etc.

In recent years drawers - above all in the case of pieces of high-quality furniture - have been provided with so-called "automatic retraction devices" which in order to terminate the closure process pull the respective drawer automatically into the closed position and secure it in the closed position against inadvertent opening. Therefore in an advantageous variant of the invention it is provided that the elongate low housing of an automatic drawer retraction device is disposed on the underside, facing away from the drawer bottom, of the supporting leg of one of the connector components in such a way that the pawl component thereof which triggers the retraction function projects, during the pull-out or push-in movement of the drawer, into the path of a catch which is disposed directly or indirectly on the guide rail fixed on the carcass or on a mounting thereof.

A damping device which slows down the retraction movement of the pawl component after it has been triggered by the catch is then advantageously provided in the housing of the automatic retraction device, and the damping device can be provided with a damper which is known *per se* and has a fluid or gaseous damping medium.

The housing of the automatic retraction device is advantageously latched with the supporting leg of the associated connector component, so that the automatic retraction device can be installed simply and quickly as required - even at a later stage.

The housing of the automatic retraction device can - depending upon the length of the retraction path as predetermined by the design - be markedly longer than the width of the supporting leg of the connector component. If this housing projects significantly over the supporting leg in the horizontal direction it is advantageous if the housing is additionally connected to the drawer frame in its region which projects over the supporting leg.

The invention is explained in greater detail in the following description of an embodiment in connection with the drawings, in which:

Figure 1 shows a side view directed at the outer face of a drawer frame which is connected to a drawer bottom in the manner according to the invention;

Figure 2 shows a view from below of the underside of the drawer frame and the drawer bottom, in the direction of the arrow 2 in Figure 1;

Figure 3 shows a view in the direction of the arrow 3 in Figure 1;

Figure 4 shows a view of the connecting arrangement according to the invention which corresponds to Figure 1 in the direction of view but is a sectional view along the arrows 4-4 in Figure 3;

Figure 5 shows the part-region placed within the circle 5 shown by dash-dot lines, on an enlarged scale;

Figure 6 shows an isometric three-dimensional view of a connector component provided for connection of a drawer bottom to the appertaining side wall;

Figure 7 shows a plan view of the connector component in the direction of the arrow 7 in Figure 6;

Figure 8 shows a view of the connector component in the direction of the arrow 8 in Figure 7;

Figure 9 shows a view of the connector component in the direction of the arrow 9 in Figure 7;

Figure 10 shows a sectional view of the connector component in the direction of the arrows 10-10 in Figure 7;

Figure 11 shows a view corresponding to the direction of view of Figure 3 of the drawer frame connected to the drawer bottom in the manner according to the invention, in which in addition the adjacent carcass wall and the pull-out guide which is inserted into the underside of the frame and constructed as a full pull-out means and an automatic drawer retraction device provided on the underside of the drawer bottom are shown schematically; and

Figure 12 shows a view from below on an enlarged scale in the direction of view of the arrow 12 in Figure 11.

Figures 1 to 5 show the connection of one of the lateral edges of a drawer bottom 10 to a drawer frame 12 which forms a side wall of a drawer by means of - in the illustrated case three - connector components 14. The special configuration of the connector components is described below in connection with Figures 6 to 10 in which a connector component 14 is shown separately.

In the illustrated case the drawer frame 12 is formed by a hollow chamber profile which, corresponding to the previously mentioned hollow chamber profile according to DE 39 34 419 C2 is constituted by two part-profiles 16, 18 bent out of sheet metal. The connector components 14 which are likewise produced from sheet metal with a greater material thickness in a punching and pressing operation are inserted into the underside of the drawer frame which is open like a channel formed by the lower part-profile 18, whereby the region of the connector components 14 lying within the channel-like opening is constructed in cross-section to correspond in each case to the internal cross-section of the lower part-profile 18. Therefore since the connector component rests in each case over a large area on the two vertical boundary faces and also on the web faces of the part-profile 18 connecting these faces, the lower edge region of the drawer frame 12 is reinforced in each case by the connector components 14. The connector components 14 have - as can be seen in particular from Figures 6 and 8 - in their part-region to be disposed in the open underside of the drawer frame 12 a U-shaped cross-section with a web wall 20 which has side wall portions 22, 24 in each case attached approximately at right angles on their lateral edges. A strip-shaped vertical contact web 26 is then attached to the lower edge of the side wall portion 24 near the drawer bottom and in the proper assembly position in the drawer frame rests behind the contact web for the lateral end wall of the drawer bottom 10 which is formed on the drawer frame 12.

A supporting leg 28 which is constituted by two leg portions 28a and 28b which are offset in height relative to one another and projects below the drawer base 10 which is to be installed is attached to the lower free end of the contact web 26, and of these leg portions the outer leg portion 28b which is further from the contact web 26 in the proper assembly position rests on the underside of the drawer bottom.

In the junction region between the leg portions 28a and 28b an elongate narrow punched-out slot 30 is provided, and from the edge of this punched out-slot formed in the leg portion 28a two adjacent parallel fixing claws 32, which are punched out of the material of the connector component 14 originally located in the punching-out region, i.e. are an integral component of the supporting leg 28, project upwards in the direction of the drawer bottom to be installed. In a manner which can be seen best in Figure 10, the fixing claws 32 are chamfered in the

region of their free ends in opposite directions in each case, so that the discernible pointed ends are produced which during the installation of the drawer bottom 10 are pressed in to engage in the underside of the drawer bottom by interlocking.

In the web wall 20, as in the vertical side wall portions 22 and 24 attached to the edges thereof, various punched-out slots or cut-out tabs which can be seen in the drawings are provided for fixing the connector components 14 in the open underside or also as fixing openings for further fittings which are to be disposed in the upper closed cavity of the drawer frame 12, but are not described in detail here because they merely illustrate examples of possible fixing means and can be replaced by other possible fixing means. The actual subject of the invention is the described arrangement and construction of the fixing claws 32 which penetrate into the drawer bottom during assembly.

In the outer leg portion 28b on which the underside of the drawer bottom rests in the proper connection position two more holes 34 - which can be seen in Figures 6 and 7 - are punched in, which - in special cases - make possible an additional connection of the drawer bottom to the connector component 14, as a fixing screw - not shown - can be screwed into the drawer bottom from the underside of the leg portion 28b in each case.

Figure 11 shows a view corresponding to that of Figure 3 of the connection of the drawer frame 12 to the drawer bottom 10, in which the drawer pull-out guide 40 which is inserted into the frame from the underside and is shown as a full pull-out means is additionally shown as well as the fixing thereof on the adjacent carcass wall 42 of the piece of furniture in which the pull-out guide is retained. The pull-out guide 40 is installed in the carcass by means of fixing angle members 46 which can be attached to the underside of the guide rail 44 fixed to the carcass on the one hand and to the inner face of the carcass wall 42 on the other hand.

The elongate low housing 48 of an automatic drawer retraction device 50 - illustrated schematically in Figure 11 - which is positioned adjacent to the supporting leg 28 on the underside of the drawer bottom 10 in the proper functioning position is shown on the underside of the supporting flange 28 of the connector component 14. Since the basic construction and operation of such automatic retraction devices are known *per se* they are not

described in detail here. The pawl component 52 which triggers the automatic retraction device connected to the drawer as it approaches the closed position of the drawer projects out of the housing 48 in the direction of the guide rail 44. In the appropriate triggering position a catch 54, which projects into the path of the pawl component 52 and approaches the pawl component 52 in the triggering position, is fixed on the underside of the guide rail 44, as can be seen in the view from below in Figure 11 which is reproduced on an enlarged scale in Figure 12.

The housing 48 of the automatic retraction device 50 is latched with the supporting leg 28 in the region aligned with the appertaining connector component, and an additional fixing is effected on the inner wall of the drawer frame 12 in the part of the housing 48 which is extended over the supporting leg 28. This fixing is effected by means of a tongue 58 which is formed integrally on the housing 48 and which can be pushed into a corresponding receptacle formed out of the inner wall of the drawer frame 12.

It can be seen that within the scope of the idea underlying the invention modifications and variants can be made to the described connecting arrangement. In the foregoing description the connection of the drawer bottom to a side wall frame is described. It is clear that a frame which forms the drawer rear wall can also be connected to the drawer bottom in the same way. The additional fixing of a fitting which is to be disposed in the interior of the hollow chamber profile forming the drawer frame 12 is shown in Figure 4 above the right-hand connecting component 14 shown in the drawing. In the illustrated case this is a connecting fitting 38 which makes possible an adjustable installation of the front panel of a drawer on the right-hand end of the drawer frame 12.

When a plurality of connector components 14 are used which are inserted so as to be offset in the longitudinal direction into the underside of the drawer frame 12, it is also possible for only one sheet metal profile corresponding to the described part-profile 16 to be used as the drawer frame 12. The function of stabilising the part-profile 18 which in the illustrated embodiment is inserted into the part-profile 16 is then carried out by the connector components 14.